

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A distance detecting apparatus comprising:

a light emitting unit that emits a light in a light emitting direction which is the direction to an object, the light having a distributed pattern which is in the form of a line;

a photographing device that obtains an image of the object along a photographing direction;

a holding mechanism that holds the light emitting unit and the photographing device in such a relation that

(a) the photographing direction is not in a plane that includes both the light emitting direction and a direction of the line, and

(b) the photographing direction is not parallel to the light emitting direction; and

a distance deriving unit that derives a distance between the object and a predetermined position by choosing a shortest one of a plurality of distance candidates depending on a position of the object, when the plurality of distance candidates are derived from the image based on a position of the distributed pattern of the light in the image obtained by the photographing device.

Claim 2 (Currently Amended): An air bag system controlling apparatus comprising:

a light emitting unit that emits a light in a light emitting direction which is the direction to an object seating on a seat of a vehicle, the light having a distributed pattern which is in the form of a line

a photographing device that obtains an image of the object along a photographing direction;

a holding mechanism that holds the light emitting unit and the photographing device in such a relation that

(a) the photographing direction is not in a plane that includes both the light emitting direction and the predetermined direction of the line, and

(b) the photographing direction is not parallel to the light emitting direction;

a distance deriving unit that derives a distance between the object and a predetermined position by choosing a shortest one of a plurality of distance candidates depending on a position of the object, when the plurality of distance candidates are derived from the image based on a position of the distributed pattern of the light in the image obtained by the photographing device; and

an air bag system controlling unit that controls an operation of an air bag based on the distance derived.

Claim 3 (Previously Presented): The air bag system controlling apparatus according to claim 2, wherein the light emitting unit emits a an infrared light, and the photographing device obtains an infrared image.

Claim 4 (Original): The air bag system controlling apparatus according to claim 2, wherein the light emitting unit emits the light when an operation of the air bag system controlling unit is required, and

the distance deriving unit derives the distance based on the image when the light emitting unit emits the light.

Claim 5 (Original): The air bag system controlling apparatus according to claim 2, wherein the light emitting unit emits the light having a distributed pattern perpendicular to the light emitting direction.

Claim 6 (Original): The air bag system controlling apparatus according to claim 2, wherein the light emitting unit emits the light having a discretely distributed pattern perpendicular to the light emitting direction.

Claim 7 (Original): The air bag system controlling apparatus according to claim 2, wherein the distance deriving unit further comprises an identifying unit that identifies a position of the distributed pattern of the light in the image by comparing a first image that is an image when the light emitting unit emits the light and a second image that is an image when the light emitting unit does not emit the light.

Claim 8 (Original): The air bag system controlling apparatus according to claim 2, wherein the distance deriving unit further comprises:
a dividing unit that divides the image into a plurality of regions; and
an identifying unit that identifies a position of the distributed pattern of the light in the image by calculating an average of a high-luminance part in each of the regions.

Claim 9 (Canceled).

Claim 10 (Original): The air bag system controlling apparatus according to claim 2, wherein the light emitting unit emits the light from a front side of the seat.

Claim 11 (Original): The air bag system controlling apparatus according to claim 2, wherein the distance deriving unit stores a relation between positions of the distributed pattern of the light in the image and distances, and derives the distance by referring to the relation stored.

Claim 12 (Original): The air bag system controlling apparatus according to claim 2, wherein the distance deriving unit derives the distance based on a position of the distributed pattern of the light in the image, by extracting a high-luminance part in the image, and identifying whether the high-luminance part corresponds to the position of the distributed pattern of the light in the image.

Claim 13 (Currently Amended): An air bag system controlling apparatus comprising:
a light emitting unit that emits a light in a light emitting direction which is the direction to an object the light having a distributed pattern which is in the form of a line;
a photographing device that obtains an image of the object along a photographing direction;
a holding mechanism that holds the light emitting unit and the photographing device, in such a relation that

(a) the photographing direction is not in a plane that includes both the light emitting direction and a direction of the line, and

(b) the photographing direction is not parallel to the light emitting direction;

a memory unit that stores a computer program that makes it possible to execute a function of deriving a distance between the object and a predetermined position by choosing a shortest one of a plurality of distance candidates depending on a position of the object,

when the plurality of distance candidates are derived from the image based on a position of the distributed pattern of the light in the image obtained by the photographing device, and a function of controlling an operation of an air bag based on the distance derived; and

a processor that can access the memory unit and execute the computer program.

Claim 14 (Previously Presented): A distance detecting apparatus comprising:

a light emitting unit that emits a light in a light emitting direction which is the direction to an object, the light having a plurality of pattern lights which are in the form of a line, the pattern lights being parallel to each other;

a photographing device that obtains an image of the object along a photographing direction; and

a distance deriving unit that derives a distance between the object and a predetermined position based on an interval between the pattern lights in the image.

Claim 15 (Previously Presented): An airbag system controlling apparatus comprising:

a light emitting unit that emits a light in a light emitting direction which is the direction to an object seated in a seat of a vehicle, the light having a plurality of pattern lights which are in the form of a line, the pattern lights being parallel to each other;

a photographing device that obtains an image of the object along a photographing direction;

a distance deriving unit that derives a distance between the object and a predetermined position based on an interval between at least two of the pattern lights in the image; and

an air bag system controlling unit that controls an operation of an air bag based on the distance derived.

Claim 16 (Original): The air bag system controlling apparatus according to claim 15, wherein the distance deriving unit stores a relation between intervals between the distributed pattern of the light in the image and distances, and derives the distance by referring to the relation stored.

Claim 17 (Original): The air bag system controlling apparatus according to claim 15, wherein the light emitting unit emits an infrared light, and
the photographing device obtains an infrared image.

Claim 18 (Original): The air bag system controlling apparatus according to claim 15, wherein the light emitting unit emits the light when an operation of the air bag system controlling unit is required, and
the distance deriving unit derives the distance based on the image when the light emitting unit emits the light.

Claim 19 (Previously Presented): An airbag system controlling apparatus comprising:
a light emitting unit that emits a light in a light emitting direction which is the direction to an object seated in a seat of a vehicle, the light having a plurality of pattern lights which are in the form of a line, the pattern lights being parallel to each other;
a photographing device that obtains an image of the object along a photographing direction;
a memory that stores a computer program that makes it possible to execute a function of deriving a distance between the object and a predetermined position based on an interval

between at least two of the pattern lights in the image obtained by the photographing device,
and a function of controlling an operation of an air bag based on the distance derived; and
a processor that can access the memory unit and execute the computer program.

Claim 20 (Original): The air bag system controlling apparatus according to claim 19,
wherein the light emitting unit emits a infrared light, and
the photographing device obtains an infrared image.

Claim 21 (Original): The air bag system controlling apparatus according to claim 19,
wherein the light emitting unit emits the light when an operation of the air bag system
controlling unit is required, and
the distance deriving unit derives the distance based on the image when the light
emitting unit emits the light.

Claim 22 (Currently Amended): A method of detecting a distance, comprising:
emitting light in a light emitting direction to thereby irradiate an object, the light
being having a distributed pattern which is in the form of a line;
obtaining an image of the object along a photographing direction, in such a manner
that

(a) the photographing direction is not in a plane that includes both the light emitting
direction and a direction of the line and

(b) the photographing direction is not parallel to the light emitting direction; and
deriving a distance between the object and a predetermined position by choosing a
shortest one of a plurality of distance candidates depending on a position of the object, when

the plurality of distance candidates are derived from the image based on a position of the distributed pattern of the light in the image.

Claim 23 (Previously Presented): A method of detecting a distance, comprising:
emitting light in a light emitting direction to thereby irradiate an object, the light having a plurality of pattern lights which are in the form of a line, the pattern lights being parallel to each other;
obtaining an image of the object along a photographing direction; and
deriving a distance between the object and a predetermined position based on an interval between the pattern lights in the image.